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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/606,067	06/24/2003	Charles E. Goodman	BOEI-1-1184	1570

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EXAMINER	
SUAREZ, FELIX E	
ART UNIT	**PAPER NUMBER**
2857	

DATE MAILED: 09/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/606,067	GOODMAN, CHARLES E.	
	Examiner	Art Unit	
	Felix E. Suarez	2857	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 May 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-43* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-33,36,37 and 41-43* is/are rejected.

7)☒ Claim(s) *34,35 and 38-40* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *02 May 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

1. Independent claims 1-29 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claims 1-29 are directed to an aeroelastic structure (reading and performing a closed form fit, from a plurality of data points) database per se. The claimed data structure is not embodied on a computer readable medium, and is not capable of causing functional change in a computer. The claimed data structure does not define any structural or functional relationship between itself and other claimed aspects of the invention. See MPEP 2106.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-4, 9, 10, 13, 14, 18,19, 30-32, 36, 37 and 41-43 are rejected under 35 U.S.C. 102(b) as being unpatentable over Kaloust (U.S. Patent No. 6,246,929).

With respect to claims 1, 13, 19, Kaloust teaches a method (or a computer program product) of analyzing test data obtained from an aeroelastic structure, the method comprising:

reading a plurality of data points, each data point representing a motion at a location on the aeroclastic structure (see col. 9, lines 9-28; col. 10, lines 4-45 and col. 12, lines 27-45);

performing a closed form fit to the plurality of data points to obtain an initial curve fit condition (see col. 23, lines 63-65 and col. 52, line 25 to col. 53 line 10); and

performing at least one non-linear transfer function frequency response curve fit to the plurality of data points (see col. 36, lines 20-23; col. 43 line 57 to col. 44 line 37 and col. 62, lines 7-39).

With respect to claim 2, Kaloust further teaches that the aeroelastic structure comprises an aircraft surface, and wherein reading a plurality of data points includes reading a plurality of data points, each data point representing a motion at a location as a function of frequency (see col. 1, lines 17-27 and col. 59, lines 47-65).

With respect to claims 3 and 14, Kaloust further teaches that reading a plurality of data points includes reading a plurality of flutter test data points (see col. 57, lines 28-42 and col. 59, lines 47-65).

With respect to claim 4, Kaloust further teaches that performing at least one non-linear optimization curve fit to the plurality of data points includes iteratively performing a plurality of non-linear optimization curve fits to the plurality of data points until a convergence criterion is satisfied (see col. 52 line 33 to col. 53 line 10).

With respect to claims 9, 18, 26 and 36, Kaloust further teaches assessing an adequacy of the non-linear optimization curve fit (see col. 53, lines 28-43).

With respect to claims 10, 27 and 37, Kaloust further teaches that performing at least one non-linear optimization curve fit to the plurality of data points includes determining a number of modes to include in the at least one non-linear optimization curve fit to the plurality of data points (see col. 60, lines 45-56).

With respect to claim 30, Kaloust teaches a system for analyzing flutter test data, comprising:

a control component (see col. 8 line 65 to col. 9 line 8 and col. 20, lines 5-60);

an input/output device coupled to receive a plurality of data points (see col. 9, lines 50-60 and col. 10, lines 10-26); and

a processor arranged to analyze the plurality of data points, the processor including:

a first component configured to read the plurality of data points, each data point representing a value at a location (see col. 9 line 61 to col. 10 line 9);

a second component configured to perform a closed form fit to the plurality of data points to obtain an initial curve fit condition (see col. 52 line 25 to col. 53 line10); and

a third component configured to perform at least one non-linear transfer function frequency response curve fit to the plurality of data points (see col. 35, lines 47-54).

With respect to claim 31, Kaloust further teaches that the input/output devise is coupled to received a plurality of data points, the plurality of data points including a plurality of flutter test data points (see col. 57, lines 28-42).

With respect to claim 41, Kaloust further teaches including a memory component operatively coupled to at least one of the control component, the input/output device, and the processor (see col. 60, lines 21-29).

With respect to claim 42, Kaloust further teaches including a data acquisition component operatively coupled to at least one of the control component, the input/output device, and the processor (see col. 10, lines 10-26 and col. 60, lines 12-29).

With respect to claim 43, Kaloust further teaches that the data acquisition component includes a plurality of data acquisition sensors (see col.9, lines 9-42).

Claim Rejections - 35 USC § 103

3. Claims 5, 6, 15, 20-23, 32 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaloust (U.S. Patent No. 6,246,929) in view of White (U.S. Patent No. 5,444,641).

With respect to claims 5, 6, 15, 22, 23, 32 and 33, Kaloust teaches all the features of the claimed invention, except that Kaloust does not teach that performing at least one non-linear optimization curve fit to the plurality of data points includes performing at least one non-linear optimization curve fit to the plurality of data points using a Jacobian matrix populated using analytically-derived sensitivities.

But White teaches in an oscillator circuit that, the non-linear equations can be solved by a suitable technique for solving systems of simultaneous non-linear

equations, such as the well-known Newton-Raphson solution procedure. The solution procedure includes solving simultaneous linear equations written as a matrix equation.

In this matrix equation is include the [J] matrix element and is so-called Jacobian matrix having the elements that are partial derivatives (see White; col. 12, lines 19-67).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Kaloust to include a non-linear equations solution as taught by White, because the non-linear equations solution of White allows to use a Jacobian matrix using analytically-derived values, as desired.

With respect to claim 20, Kaloust in combination with White teaches all the features of the claimed invention, and Kaloust further teaches that the plurality of flutter test data points are acquired using a plurality of sensors (see Kaloust; col. 9, lines 9-28 and col. 10, lines 27-42).

With respect to claim 21, Kaloust in combination with White teaches all the features of the claimed invention, and Kaloust further teaches that the first computer program portion is further configured to read a plurality of flutter test data points acquired using a plurality of sensors (see Kaloust; col. 52 line 22 to col. 53 line 10 and col. 60, lines 21-56).

Final Rejection

Response to Arguments

4. This action is responsive to papers filed 05/02/2005.

5. Applicant's arguments filed 05/02/2005 have been fully considered but they are not persuasive respect to independent claims 1, 13, 19 and 30. The Examiner has thoroughly reviewed applicant arguments, but believes the cited references to reasonably and properly meet the claimed limitations.

Applicants' primary argument is that Kaloust [U.S. Patent No. 6,246,929] do not teach or suggest "*performing a closed form fit to the plurality of data points to obtain an initial curve fit condition* and *performing at least one non-linear transfer function frequency response curve fit to the plurality of data points*".

With respect to "*performing a closed form fit to the plurality of data points to obtain an initial curve fit condition*",

Kaloust teaches in a simulation model that, instead of storing a large table look-up data for the vehicle's aerodynamic coefficients, the static aerodynamic coefficient surfaces can be curve fitted to yield nonlinear functions that describes these surfaces. Kaloust also teaches one needs to keep in mind that the curve fitted surface do have accuracy errors associated with them. However, the functions describing the aerodynamic coefficient surfaces are very accurate in most cases (see Kaloust; col. 52, lines 22-56).

The Examiner considers that the static aerodynamic coefficient surfaces can be curve fitted to yield nonlinear functions; to obtain an initial curve fit condition.

The Examiner also considers that, the closed form fit is performed using a well-known orthogonal polyreference (OPR) technique, to obtain an initial curve fit condition; as it is described in the Applicant's specification, page 5, lines 15-21.

With respect to, "*performing at least one non-linear transfer function frequency response curve fit to the plurality of data points*".

Kaloust teaches in a tracking a horizontal acceleration command, one can build a nonlinear equation that relates AY_{cmd} to commanded angle (steady state) β_{cmd} ; and one can construct a transfer function relating AY_{cmd} to β_{cmd} (see Kaloust; col. 36, lines 20-23 and col. 43 line 57 to col. 44 line 37).

Kaloust also teaches that in the illustrated simulation, that the frequency response of the modeled fin actuator is lower than the outputted frequency of the command signal. Accordingly, while the amplitude of the outputted command signal (solid line) varies widely during the time period of about 4.5 to 6.2 seconds, the amplitude of the response of the actuator (dashed line) varies much less dramatically. Accordingly, as illustrated in FIGS. 24B-24D, the fin actuator may act like a low-pass frequency filter for the command signal (see kaloust; col. 62, lines 7-39).

The Examiner considers that, the aircraft (or aeroelastic structure) control system of Kaloust is capable to perform a nonlinear transfer function to obtain a frequency response curve from a modeled fin actuator; where the fin actuator may act like a low-pass frequency filter for the command signal.

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Allowable Subject Matter

7. Claims 34, 35, 38-40, are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. The following is a statement of reasons for the indication of allowable subject matter:

Claims 34 and 35, would be allowable over the prior art for at least the reason that the prior art fail to teach or suggest that:

wherein performing at least one non-linear optimization curve fit to the plurality of data points includes performing at least one non-linear optimization curve fit to the plurality of data points using a Jacobian matrix populated using analytically-derived sensitivities based on a State Space Model (Pole Zero Model).

Claims 38-40, would be allowable over the prior art for at least the reason that the prior art fail to teach or suggest, transforming the plurality of data points into a State Space Model (Pole Zero Model).

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Felix Suarez, whose telephone number is (571) 272-2223. The examiner can normally be reached on weekdays from 8:30 a.m. to 5:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marc Hoff can be reached on (571) 272-2216. The fax phone numbers for the organization where this application or proceeding is assigned is 571-273-8300 for regular communications and for After Final communications.

August 30, 2005

F.S.

Marc Hoff

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